## Product Description

The PO1000 and PO1003 modules are part of the Ponto Series and each module has 16 opto isolated 24 Vdc or 48 Vdc digital inputs. The modules use positive logic (“sink”) and they are ideal solutions for control and supervision process.

The picture shows the product assembled in a base for digital I/O with spring terminal blocks. The main features are:

- High density of I/O with feeding and return for each individual input.
- Hot swap, no interference on panel cabling.
- Field cabling is directly connected to the base, thus eliminating need for intermediary terminal
- blocks.
- Remote and local diagnosis, with indication for no communication with CPU and failure on external power supply.
- Protection of all inputs through one fuse assembled in the base PO6103.
- Automatic addressing.
- Automatic verification of module type by the bus head.
- Status operation via LEDs indicators.
- A input can interrupt the CPU for immediate processing.
- Identification tag.

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## Ordering Information

### Included Items

The product packing comes with:

- PO1000 or PO1003 Module
- Installation Guide

### Product Code

Use the following codes when ordering the product.

| Code | Description |
|---|---|
| **PO1000** | 16 DI 24Vdc Opto Module |
| **PO1003** | 16 DI 48Vdc Opto Module |

### Related Products

Depending on your system requirements, the following products might be ordered along with the PO1000.

| Code | Description |
|---|---|
| **PO6000** | Spring Digital I/O base |
| **PO6100** | Spring Digital I/O base with fuse |
| **PO8522** | End bracket for rail |
| **PO8523** | Spring terminal tool |
| **PO8520** | 16 Fuse 3 A – spare part |

## Features

| | PO1000 |
|---|---|
| **Module type** | 16 24Vdc sink digital input |
| **Input voltage** | 24 Vdc (15 to 30 Vdc including ripple)<br>15 to 30 Vdc; status 1<br>0 to 5 Vdc; status 0 |
| **Input current** | 3 mA (24 Vdc) |
| **Input type** | Type 1, for switches and sensors with 3 wires |
| **Input impedance** | 8 KOhm |
| **Filtering** | 2 ms |
| **Terminal block configuration** | One terminal block for external supply and one terminal block by input |
| **Input delay time** | 2 ms |
| **Status indication** | One LED by input point |
| **Diagnosis indication** | One multifunctional LED with module OK indication, not accessing module, open fuse and input failure |
| **Configurable parameters** | External power supply missing<br>Input self testing |
| **Hot swap** | Yes |
| **Protection** | One 300 mA fuse for protection of all inputs.<br>External 3A fuse for power supply protection for each input point, when PO6100 is used.<br>Power supply Inversion polarity protection |
| **External power supply** | 19 to 30 Vdc, including ripple, for input feeding.<br>Positive on 'A ' terminal and Negative on ' B ' terminal. |
| **Isolation** | |
| **Inputs to ground** | 1500 Vac, 1 minute, 250 Vac continuos |
| **Inputs to logic circuit** | 1500 Vac, 1 minute, 250 Vac continuos |
| **Among inputs** | No isolation |
| **Bus current consumption** | 80 mA |
| **Power dissipation** | 1,3 W with all points activated (usual)<br>1,7 W with all points activated (maximum)<br>0,6 W with all points off |
| **Maximum operating temperature** | 60 °C |
| **Dimensions** | 100 x 52 x 84 mm |
| **Standards** | - IEC 61131-2:2003, clauses 8 and 11<br>- CE, EMC and Low-Voltage (LVD) Directives.<br>CE |
| **Bases** | PO6000, PO6100 |

**Protection:** an internal thermo devide fuse is used to protection all input signals. After the overload or short-circuit the device recover the normal operation.

**Self Test**: all input points may be automatic tested by the system. This characteristic is enable by the user in the configuration step. If enable, the all points will be tested each 6 seconds, during 4 miliseconds. During the test time, the module will freeze the last input datas. The input LEDs will flash during this time too.

**Power supply interruptions:** Interruptions in power port are supported if not longer than 10 ms and if the module is powered with it's nominal 24 Vdc voltage or greater. Longer interruptions or in voltages lower than the nominal may cause modules reset.

| | **PO1003** |
|---|---|
| **Module type** | 16 48Vdc sink digital input |
| **Input voltage** | 48 Vdc ( 34 to 60 Vdc includding ripple )<br>34 to 60 Vdc; status 1<br>0 to 10 Vdc; status 0 |
| **Input current** | 3 mA (48 Vdc) |
| **Input type** | Type 1, for switches and sensors with 3 wires |
| **Input impedance** | 16 KOhm |
| **Filtering** | 2 ms |
| **Terminal block configuration** | One terminal block for external supply and one terminal block by input |
| **Input delay time** | 2 ms (usual) |
| **Status indication** | One LED by input point |
| **Diagnosis indication** | One multifunctional LED with module OK indication, not accessing module, open fuse and input failure |
| **Configurable parameters** | External power supply missing<br>Input self testing |
| **Hot swap** | Yes |
| **Protection** | One 300 mA fuse for protection of all inputs.<br>External 3A fuse for power supply protection for each input point, when PO6100 is used.<br>Power supply Inversion polarity protection |
| **External power supply** | 38 to 60 Vdc, including ripple, for input feeding.<br>Positive on 'A ' terminal and Negative on ' B ' terminal. |
| **Isolation** | |
| **Inputs to ground** | 1500 Vac, 1 minute, 250 Vac continuos |
| **Inputs to logic circuit** | 1500 Vac, 1 minute, 250 Vac continuos |
| **Among inputs** | No isolation |
| **Bus current consumption** | 80 mA |
| **Power dissipation** | 1,9 W with all points activated (usual)<br>2,8 W with all points activated (maximum)<br>0,6 W with all points off |
| **Maximum operating temperature** | 60 °C |
| **Dimensions** | 100 x 52 x 84 mm |
| **Standards** | - IEC 61131-2:2003, clauses 8 and 11<br>- CE, EMC and Low-Voltage (LVD) Directives.<br>CE |
| **Bases** | PO6000, PO6100 |

**Protection:** an internal thermo devide fuse is used to protection all input signals. After the overload or short-circuit the device recover the normal operation.

**Self Test**: all input points may be automatic tested by the system. This characteristic is enable by the user in the configuration step. If enable, the all points will be tested each 6 seconds, during 4 miliseconds. During the test time, the module will freeze the last input datas. The input LEDs will flash during this time too.

**Power supply interruptions:** Interruptions in power port are supported if not longer than 10 ms and if the module is powered with it's nominal 24 Vdc voltage or greater. Longer interruptions or in voltages lower than the nominal may cause modules reset.

## Installation

ATTENTION:
ESD (Electro Static Discharge) sensitive device. Always touch a grounded metallic object before handling the device.

### Electrical Installation

The following diagram shows the cabling for 2 sensors on the PO1000 module installed on the PO6100 base. The same configuration applies to the PO1003.

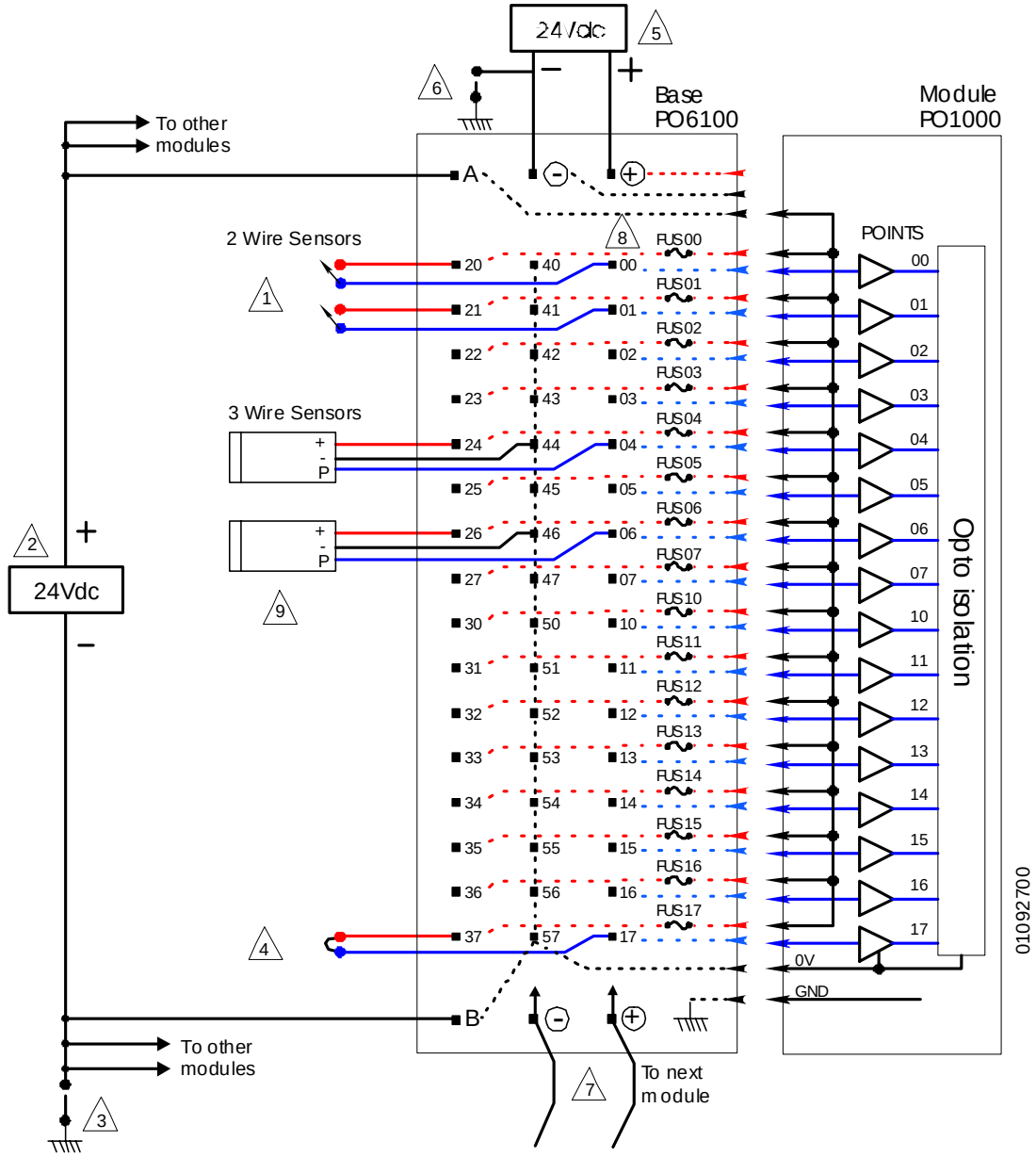


**Diagram notes:**

1 - Sensors with 2 wires should have connected on the terminal blocks numbered from 00 to 17 and 20 to 27.

2 - Power supply for the field sensors. The power supply must be connected to the A (+24/48 Vdc) and B inputs for each base, as shown on the diagram. The power supply must guarantee an energy output within the module requirements.

3 - O The power supply common point for the field sensors (0V) should be connected to the panel grounding. This connection is not mandatory, but it is highly recommended in order to reduce electrical interference in automation systems.

4 - O This connection is required when the diagnosis of no voltage for field sensors are needed.

5- The terminal blocks ( + ) and ( - ) can be used for feeding of other modules of the bus. The PO1000 and PO1003 do not use this terminals blocks.

6 - The power supply common point for the module (0V) should be connected to the panel grounding. This connection is not mandatory, but it is highly recommended in order to reduce electrical interference in automation systems..

8 – In case of necessity of individual input protection, use fast fuses with maximum value of 250 mA in accordance to the electrical project specifications.

ATTENTION:

Each Ponto module use a particular connection to A and B terminal blocks. In this case the terminal B is connected to 0 Vdc and the terminal A is connected to 24 +Vdc.

The terminal blocks identification follow direct relation to the I/Os and LEDs as shows below::

| **Module Input** | **00** | **01** | **02** | **03** | **04** | **05** | **06** | **07** | **10** | **11** | **12** | **13** | **14** | **15** | **16** | **17** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Input terminal | 00 | 01 | 02 | 03 | 04 | 05 | 06 | 07 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 |
| Common terminal ( 0 Vdc) | 40 | 41 | 42 | 43 | 44 | 45 | 46 | 47 | 50 | 51 | 52 | 53 | 54 | 55 | 56 | 57 |
| +24 or +48 Vdc terminal | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 30 | 31 | 32 | 33 | 34 | 35 | 36 | 37 |

ATTENTION:

Atmospheric discharges (thunders) may cause damages to the modules although it's protections.

Additional protections should be used if module's power comes from a power supply located outside the cabinet where the module is installed, because it could be vulnerable to this kind of discharges.

If the field wiring of the input points is susceptible to this kind of discharge, surge suppressors should be used.

## Mechanical Assembly

The mechanical assembly is described in the Ponto Series Utilization Manual.

Please adjust the mechanical code on the assembly base to 0 (zero) on switch A and 0 on switch B for the PO1000 and 0 (zero) on switch A and 3 on switch B for the PO1003.

# Parameterization

The CPU or field network head defines via software the PO1000/PO1003 parameterizations. Such parameterization may be set by the MasterTool when using Altus CPUs or by the software that configures the field bus master. For further information please consult Ponto Series Utilization Manual, MasterTool Utilization Manual and Manuals for the Interfaces and Field Network Heads. The parameterization is set through user-friendly menus. For reference purposes, following are the binary codes.

## Parameters Bytes

The PO1000 and PO1003 modules are defined by 1 byte.

| Byte | Parameters |
|---|---|
| **0** | General |

| Byte 0 – General | | | | | | | | Description |
|---|---|---|---|---|---|---|---|---|
| 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 | |
| | | | | | | | **1** | Number of parameters bytes ( always 1 ) |
| | | **0** | **0** | **0** | **0** | **0** | | Always zero |
| | **0** | | | | | | | Self testing disable |
| | **1** | | | | | | | Self testing enable |
| **0** | | | | | | | | Power supply diagnosis disable |
| **1** | | | | | | | | Power supply diagnosis enable |

# Diagnosis

## Diagnosis Bytes

The PO1000/PO1003 modules have one byte for module operating diagnosis.

| Byte | Diagnosis |
|---|---|
| **0** | General |

| Byte 0 - General | | | | | | | | PROFIBUS Message | Description |
|---|---|---|---|---|---|---|---|---|---|
| 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 | | |
| **0** | | | **0** | **0** | **0** | **0** | **0** | **-** | Always zero |
| | | **0** | | | | | | **-** | Input points OK |
| | | **1** | | | | | | **01** | Hardware failure |
| | **0** | | | | | | | **-** | External DC voltage on |
| | **1** | | | | | | | **02** | External DC voltage off |

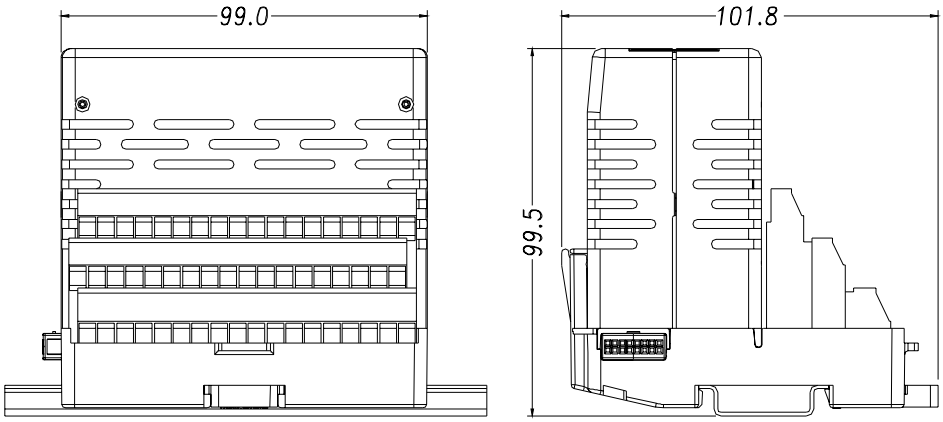
## Diagnostic LED

This module diagnostic LED shows the following situations:

| DG LED | Meaning | Causes |
|---|---|---|
| ON | Normal operation | |
| Blinking 1X | Not accessed module or logic problem | - Position with wrong type module<br>- Module not declared<br>- Module damaged |
| Blinking 3X | External DC voltage missing | - External power supply with lower limit<br>- Open fuse |
| Blinking 4X | Input point failure | - One or more input points damaged |

## Physical Dimensions

Dimensions in mm.




## Maintenance

The hot swap procedure is described in the Ponto Series User's Manual.

## Manuals

For further technical details, configuration, installation and programming of Ponto Series products please consult following documents:

| Document Code | Description |
|---|---|
| **MU209000** | User's Manual – Serie Ponto |
| **MAN/MT4100** | Programming Manual – MT4100 |